Cancer Treatment Communications 4 (2015) 200–202

Contents lists available at ScienceDirect

Cancer Treatment Communications

journal homepage: www.elsevier.com/locate/ctrc

Complete laparoscopic sigmoid colectomy for obese patient with sigmoid colon cancer

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ARTICLE INFO

Article history:
Received 19 May 2015
Received in revised form
15 October 2015
Accepted 5 November 2015

Keywords:
Laparoscopy
Sigmoid colon cance
Surgical anastomosis
Natural orifice specimen extraction

ABSTRACT (CLINICAL PRACTICE POINTS)

What is already known about this subject?: After nearly 20 years of development, laparoscopic surgery for colon cancer has emerged as the standard procedure compared to open surgery with similar oncologic outcomes and superior perioperative results. Usually, an abdominal incision is required for anastomosis and specimen extraction for laparoscopic colon surgery. Recently, natural orifice specimen extraction (NOSE) and intracorporeal anastomosis have been proposed to improve the quality of laparoscopic colon resections. This approach can eliminate a larger abdominal incision other than that for trocar placement. However, intracorporeal anastomosis is the major challenge in laparoscopic surgery. Technique of delta-shaped anastomosis which was used for the gastric cancer surgery was reported firstly in 2002. and there was no report on the feasibility and safety of totally laparoscopic resection with delta-shaped anastomosis for colon cancer surgery till now. we describe this simple and safe technique of intracorporeally delta-shaped anastomosis in sigmoid colectomy combined with transvaginal extraction of the specimen.
What are the new findings?: Natural orifice specimen extraction and intracorporeal anastomosis have been proposed to improve the quality of laparoscopic colon resections. This case report demonstrates that the technical innovations of transvaginal specimen extraction and an intracorporeal delta-shaped anastomosis is considered a more feasible and safer procedure, and obesity does not adversely affect the outcomes of this technique with respect to postoperative recovery.
How might it impact on clinical practice in the foreseeable future?: This case report describes the feasibility, safety and shortterm outcome of an intracorporeal delta-shaped anastomosis technique for laparoscopic sigmoid colectomy combined with transvaginal extraction of the specimen in an obese patient. Our findings suggest that this technique is more feasible and safer for patients with sigmoid colon cancer than other natural orifice specimen extraction approaches and that obesity does not adversely affect the outcome of this technique with respect to postoperative recovery. We suggest that intracorporeal deltashaped anastomosis and transvaginal specimen extraction may be an appropriate technique for sigmoid colectomy without complications in suitable patients.

1. Introduction

After nearly 20 years of development, laparoscopic surgery is increasingly performed for colorectal cancer worldwide. Laparoscopic colon resections are practical and safe compared with open surgery and exhibit similar oncological outcomes and favorable postoperative results. Typically, the procedure of anastomosis and specimen extraction need an abdominal wall incision in laparoscopic colon surgery. Recently, by the use of NOSE (natural orifice specimen extraction) and intracorporeal anastomosis techniques, the laparoscopic colon resections have been improved. The technical innovations of transvaginal specimen extraction and intracorporeal anastomosis might maximize the benefits of laparoscopic surgery. We report a case of a complete laparoscopic sigmoid colectomy with an intracorporeal delta-shaped anastomosis and extraction of specimen through vagina.

2. Case report

A 65-year-old female patient who presented with blood in the stool and diarrhea was admitted. The patient's medical history was significant for hypertension. She had no history of smoking, and her body mass index was 37 kg/m^2. The patient underwent a colonoscopy that revealed a sigmoid neoplasm approximately 33 cm from the anus. Multiple biopsies confirmed colon adenocarcinoma. The preoperative routine chest x-ray, abdominal ultrasound, and

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http://dx.doi.org/10.1016/j.ctrc.2015.11.001

abdominal and pelvic computed tomography examinations indicated no pulmonary, hepatic, or other distant metastases. The preoperative carcinoembryonic antigen level was 5.48 ng/mL, and the hemoglobin was 122 g/L. The patient did not receive a perioperative blood transfusion. The preoperative clinical stage of the patient was up to T3. According to the patient's wishes and to minimize complications, we use a new method of intracorporeal delta-shaped anastomosis using only endoscopic linear staplers and transvaginal specimen extraction. Mechanical bowel preparation was performed the night prior to the surgery. After induction of anesthesia, a Foley catheter and a nasogastric tube were inserted. During the procedure, patients were placed in the Trendelenburg position. The pneumoperitoneum were induced and maintained at 12 mmHg for the entire duration of the procedure. A radical medial-to-lateral sigmoid colectomy followed by a delta-shaped colorectal anastomosis with a linear stapler was performed. Mobilization of the bowel and dissection of the lymph nodes were performed laparoscopically following the principles of complete mesocolic excision. After the proximal and distal incisal edge, approximately 10.0 cm distant from the sigmoid neoplasm, were transected by a straight endoscopic linear cutter, a small incision was created in each colon wall approximately 1.0 cm from the stump on the contralateral side of the mesentery. Subsequently, the two anvils of a endoscopic linear stapler were inserted into each colon wall through the small incision, and the incision between each colon wall was closed using a linear stapler. A V-shaped anastomosis was also made in the wall using a linear stapler. The remnant openings were closed using a straight endoscopic linear cutter after confirming the lack of leakage or bleeding from the anastomosis. The culdotomy was enlarged with an ultrasonic scalpel. The specimen were placed in a protective plastic bag and then extracted through a transvaginal wound protector. The culdotomy was sutured laparoscopically. The estimated blood loss was 20 mL and the operating time was 156 min. The patient followed a satisfactory postoperative course without complications. No intraoperative vaginal injuries were encountered. Clear liquids were resumed on postoperative day 2, and a soft diet was allowed on postoperative day 3. The length of hospital stay was 7 d. The postoperative pathologic diagnosis was adenocarcinoma of the sigmoid colon (T2N2). Sixteen lymph nodes were retrieved from the colon, and the proximal and distal margins of the resection were negative. The patient underwent postoperative chemotherapy and was followed for one year; there was no recurrence or metastasis (Fig. 1).

3. Discussion

This case describes a transvaginal specimen extraction and intracorporeal anastomosis technical innovation.

Laparoscopic-assisted colon resection for cancer exhibits clear advantages over open resection with respect to the less pain, improved cosmesis, earlier bowel function, and shorter hospital stay. However, the incision often causes postoperative pain, wound infection, and incisional hernia, which reduce the advantages of this laparoscopic-assisted colectomy operation.

The purpose of intracorporeal anastomosis is to reduce the extension of the abdominal incision and to minimize wound-related complications. The delta-shaped anastomosis technique was first reported in 2002 for gastric cancer surgery [1], and our report describes the details of a complete laparoscopic resection with a delta-shaped anastomosis for colon cancer surgery.

The procedure of NOSE does not involve extraction mini-laparotomy, has been developed as a means of decreasing the incidence of surgical wound complications. Some limitations have been associated with transanal specimen extraction procedures, which might not be possible in patients with bulky tumors, a thick mesentery, a narrow rectum, or anal stenosis. In addition, the risk of damage to anal sphincter function has not been fully investigated. The procedure of extraction of the specimen through natural orifices such as the vagina in NOSE has been established as a preferred route because the vagina has superior healing ability and elasticity [2,3]. In 1993, Breda et al. [4] first performed the new method of transvaginal specimen extraction in NOSE for a patient with a tuberculous kidney. In 2007, Wilson et al. [5] used the transvaginal route after a right hemicolectomy for right colon cancer. In 2008,Dozois et al. [6] introduced a new method of a complete colectomy with transvaginal specimen extraction for patients with hereditary nonpolyposis colon cancer. There is limited data on the technique of complete laparoscopic sigmoid colectomy with intracorporeal delta-shaped anastomosis and transvaginal specimen extraction for sigmoid colon cancer.

The benefits of a complete laparoscopic colectomy include the following: reduced tissue trauma, less pain, improved cosmesis, earlier bowel function, and shorter hospital stay. The risk of tumor seeding and abdominal abscess during transvaginal delivery can be avoided if proper oncologic principles are followed and specimen handling is performed using a specimen retrieval bag. We used a protective barrier to reduce the incidence of these problems. There are few reports which describe the complications

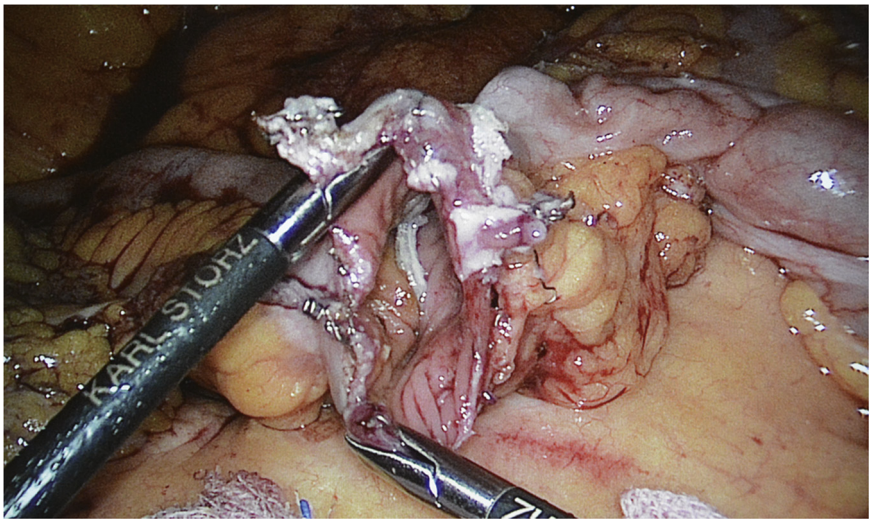

Fig. 1. A V-shaped anastomosis was made on the wall.

related with a culdotomy. The limitations of a culdotomy are previous pelvic surgery and tumor size. This technique is considered a more feasible and safer procedure than other NOSE approaches for patients with sigmoid colon cancer [7], and obesity does not adversely affect the outcomes of this technique with respect to postoperative recovery.

We suggest that intracorporeal delta-shaped anastomosis and transvaginal specimen extraction may be an appropriate technique for sigmoid colectomy without complications in suitable patients. However, this surgery should be performed by a well-trained expert surgeon. This method would be an ideal technique for laparoscopic colon resection.

Author contributions

Wang Z and Zhou ZX designed research; Wang Z, Zhang XM and Hu JJ analyzed data; Wang Z and Zhou ZX wrote the paper.

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